

REMARKS

This application has been carefully reviewed in view of the above-referenced final Office Action, and reconsideration is requested in view of the following remarks. The Examiner's continued diligence in this application is greatly appreciated.

Regarding the Rejections under 35 U.S.C. §103

Claims 1-5, 9-16, and 19-31 are rejected as being unpatenable over Inuzuka in view of Ben-Bassat et al. Claims 6-8, 17, and 32 are rejected as being unpatenable over Inuzuka in view of Ben-Bassat et al. and in further view of "Hartman et al." Applicant assumes that the 103 rejection of claims 6-8 and 15-17 is based upon the Kawata patent cited by the examiner and listed on PTO Form 892, U.S. 6,340,649, and not upon a patent to Hartman, for which a patent number has not been provided. Applicant respectfully traverses these rejections as follows:

Initially, Applicant notes with appreciation that Applicant's arguments with respect to the 35 USC 103(a) rejection of the claims over the Inuzuka reference in combination with the Ben-Bassat et al. reference were persuasive as that ground of rejection was withdrawn.

The new grounds of rejection relies upon the same references, Inuzuka and Ben-Bassat, asserts that the references, alone or in combination, teach all recitations of the claims. However, as argued in previous responses filed in this application, several elements of the claimed invention are not present in the cited references. Particularly, as discussed with Examiner File and her supervisor Examiner David Payne during a telephone interview of January 23, 2007, the recitations of:

“a frequency generator that generates a local oscillator signal without use of a piezoelectric crystal;”

“an oscillator that generates the RF transmitter carrier signal without use of a piezoelectric element”, or

“generating a local oscillator signal without use of a piezoelectric crystal”,

or the like, found in various ones of the independent claims, is not taught, disclosed or suggested by the references, whether considered singly or in combination.

As noted in the previous two responses, generating a local oscillator signal without use of a crystal provides advantages in situations where very low device size and cost are paramount. The examiner is again respectfully directed to page 4, lines 3-10; page 6, line 20 to page 7, line 20; page 9, lines 7-12, 20-30; page 20, lines 7 on; as well as other portions of the specification, in which the use of and advantages associated with a frequency reference without the use of crystal materials is discussed.

As previously argued, the Inuzuka and Ben-Bassat et al. references, even when considered in combination, fail to teach at least the non-piezoelectric crystal recitation of the claims, and indeed the Ben-Bassat reference, upon which the rejection relies to teach a frequency generator without use of a piezoelectric crystal, actually teaches away from this aspect of the claims. While the Ben-Bassat reference at column 10, lines 8-10, discusses “any suitable device such as a quartz crystal, ceramic resonator, SAW resonator, etc.” it is important to note that all of these devices are piezoelectric in nature. A reading of Ben-Bassat makes it clear that this reference does not contemplate the use of non-piezoelectric devices and indeed the reference teaches away from non-piezoelectric resonators. Ben-Bassat presents his frequency source in the context of a particular system that is tolerant to the characteristics of his SAW frequency sources. Consider, for instance, his teaching that a bandwidth of no more than 10 MHz is desirable for a resonator used in his exemplary system, at column 10, line 32. For the frequencies discussed by Ben-Bassat, this translates to relatively high values for Q of 90 for the case of a 900 MHz carrier and 240 for the case of a 2.4 GHz carrier. These values are high, with a Q of 240 for the case of the 2.4 GHz carrier being clearly beyond the range of what could reasonably be achieved with even discrete lumped-element LC resonators. For the case of RC resonators, Q has no real meaning. It is clear that the Ben-Bassat was not contemplating lumped-element oscillators or other non-piezoelectric crystal technology. Of course, the examiner has acknowledged that Inuzuka teaches only crystal elements as a reference for his frequency sources.

Moreover, with regard to the SAW resonator taught by Ben-Bassat, the examiner was previously directed to the web note by Com-Dev Products at URL http://www.saw-device.com/pdfs/what_is_a_saw_filter.pdf, a copy of which is attached to the previous response for the examiner's review. For the case of ceramic filters, the examiner was respectfully directed to the technical note from Integrity Technology Corporation at URL <http://www.integritytechnology.net/Resonators/Resonator-Technote-1.pdf>, a copy of which was included with the previous response. The Examiner has initialed both of these references previously submitted in the IDS filed with the previous response. Thus, the Ben-Bassat mention of SAW resonators and ceramic filters does not suggest or teach "a frequency generator that generates a local oscillator signal without use of a piezoelectric crystal" as recited in claim 1 and similarly in the other independent claims.

Applicant notes for the record that these differences between the claimed invention and the cited references were discussed briefly with Examiner File in a telephonic interview on July 31, 2006 and again in a telephone interview with Examiner File and Examiner Payne on January 23, 2007. During the second interview, the undersigned noted that these arguments regarding the lack of a piezoelectric crystal were never addressed by the examiner. The examiner is accordingly and respectfully requested to address this issue in writing in response to this filing.

Second, in addition to the above, Applicant respectfully renews the arguments put forth regarding the mitigation effects afforded by conversion prior to correlation discussed in the paper filed on August 2, 2006 at pages 11 and 12, which are herein incorporated by reference. The specification teaches that differentially detecting the signal prior to correlation, i.e. symbol matched filtering, is important in the mitigation of certain undesirable effects associated with the use of a non-piezoelectric crystal for generation of a local oscillator signal, such as frequency offsets and phase noise. The examiner is again respectfully directed to the following passages of the specification: page 5, lines 6-10, 15-26; page 7, lines 5-7, 10-15; page 13, line 19 to page 18

(in which a detailed treatment of frequency offset and phase noise mitigation is to be found); page 18, lines 8-11; page 20, lines 7-13, for example.

This aspect of the invention provides compensation for some of the more undesirable effects that might be encountered with the use of non-piezoelectric technology, which is inherently less stable than piezoelectric-based technology. In so doing, the invention provides a meaningful way to provide for the use of lower cost, noisier frequency references.

Concluding Remarks

The undersigned notes that other distinctions exist between the cited art and the claims. However, in view of the clear distinctions pointed out above, further discussion is believed to be unnecessary at this time. Failure to address each point raised in the Office Action should accordingly not be viewed as accession to the Examiner's position or an admission of any sort.

No amendment has been made to the claims in this response.

In view of this communication, all claims are now believed to be in condition for allowance and such is respectfully requested at an early date. If further matters remain to be resolved, the undersigned respectfully requests the courtesy of an interview. The undersigned can be reached at the telephone number below.

Respectfully submitted,

/Renee' Michelle Leveque/

Renee' Michelle Leveque
Reg. No. 36,193
Leveque Intellectual Property Law, P.C.
221 E. Church Street
Frederick, MD 21701
301-668-3073
301-668-3074 fax

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